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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,976	09/18/2003	Brian H. Harrison	36115	8615
116	7590	05/08/2006	EXAMINER	
PEARNE & GORDON LLP 1801 EAST 9TH STREET SUITE 1200 CLEVELAND, OH 44114-3108			SANDERS, KRIELLION ANTIONETTE	
			ART UNIT	PAPER NUMBER
			1714	

DATE MAILED: 05/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/666,976

Applicant(s)

HARRISON ET AL.

Examiner

Kriellion A. Sanders

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 6-23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lee et al, US Patent No. 5516952.

Lee et al discloses a process for breaking down rubber polymer materials by selective oxidative decoupling of carbon-carbon, carbon-sulfur and sulfur-sulfur bonds at supercritical or near supercritical conditions for water and wherein supercritical water or water, near supercritical conditions, is used as a solvent and a reforming agent is used to produce relatively high yields of lower molecular weight hydrocarbons and oxygenated hydrocarbons which are suitable for use as a fuel or to produce various commodity chemicals, specialty chemicals or both. The invention generally relates to a method for recovering commercial products from scrap rubber, and more particularly to a selective

oxidative decoupling process for converting polymeric elastomers into lower molecular weight compounds which can be used as chemical feedstocks, such as for repolymerization into pure or virgin rubber polymer, or which can be used as a fuel. The reaction is generally carried out at a temperature and at a pressure at, near to, or above the critical temperature (about 647.degree. K.) and critical pressure (about 218 atmospheres) of water; however, conditions below the critical conditions are generally less effective. The reaction time or residence time in the reactor depends upon various factors such as the amount of oxygen, the temperature and pressure of the reaction mixture, oxidant and rubber polymer concentration in the reaction mixture, and the like, and can generally range from about 3 seconds to about 1 hour. Most rubber materials can be processed within a residence time of 3minutes. Typical operating conditions are:

Temperature=374.degree.-500.degree. C., preferably 380.degree. C. to 450.degree. C.

Pressure=218-400 arm, preferably 220 to 270 atm

Mode: Continuous, batch, semi-batch

Feed: Premixed or in situ mixed

However, the process can also be operated under but near critical conditions, with or without a catalyst. The conditions are:

Temperature=200.degree.-374.degree. C., preferably 300.degree.-374.degree. C.

Pressure=70-218 atm, preferably 150-218 atm.

Patentee's invention is thought to include scrap rubber derived from tires or is an obvious suggestion to use tire as the scrap material to be broken down. It is customary for tires to include carbon black. Carbon black is most likely inherently included in the scrap tire material used for the invention. See the abstract and col.2, line 9 through col. 5, line 53 and col 7, lines 28-62. No patentable difference is seen between the present and patented inventions.

***Response to Arguments***

1. Applicant's amendment and arguments filed 2/6/06 have been fully considered but they are not persuasive.
2. Applicant has amended the current claims to indicate that air is purged from the reactor. Applicant then argues that Lee et al does not disclose this process parameter. Applicant's argument has not been found to be persuasive in light of applicant's description of how the reactor is purged at page 8, second complete paragraph of the specification. In the specification applicant indicates that air is urged with steam generated during the heating step. Applicant also indicates that air may be purged with an inert gas. This new process parameter included in applicant's claims has not been found to be persuasive in that although Lee et al does not refer to the purging of air in his description of the invention, the water employed in the patented process is of such a temperature when it is heated that it would inherently generate steam in the reactor. This generating of steam would inherently purge the air in the reactor. See col. 9, lines 5-60. It is noted that applicant does not include this purging process in his working example and it is not clear that any result of an unexpected nature is achieved by purging the air with steam.

Claims 1--23 are rejected under 35 U.S.C. 103(a) as obvious over Lee et al as applied to claims 1-3 and 6-23 above and further in view of Hunt et al, US Patent No. 5891926. Hunt et al discloses a devulcanization process for rubber that can be carried out by heating the cured rubber in the presence of 2-butanol to a temperature of at least about 150.degree C. under a pressure of at least about  $3.4 \times 10^6$  Pascals (Pa). To increase the rate of the devulcanization process, the cured rubber will typically be cut, milled or ground to a relatively small particle size. It is normally preferred for the temperature to be no more than about 300.degree C. to minimize the level of polymer degradation. The devulcanization process will typically be conducted at a temperature which is within the range of about 150.degree C. to about 300.degree C.

The invention utilizes a pressure which is within the range of about  $6.9 \times 10^6$  Pascals (1000 lbs/in.<sup>2</sup>) to about  $2.8 \times 10^7$  Pascals (4000 lbs/in.<sup>2</sup>). It is normally preferred for the cured rubber being devulcanized to be immersed in a bath of 2-butanol, thereby producing a mixture of solid cured rubber, solid devulcanized rubber and in most cases additional solid residue, such as fillers (carbon black, silica, clay, and the like) and/or metals, and a solution of the devulcanized rubber in the 2-butanol. Patentee indicates that it is also desirable to conduct the process under an inert gas atmosphere, such as nitrogen. Carbon black is inherently included in the scrap tire material used for the process of this invention. See the abstract and col.2, line 67 through col. 4, line 19. The process of Lee et al and Hunt et al are essentially the same with the exception that Lee utilizes water as a solvent and Hunt et al utilizes an alcohol as a solvent. Since the references recognize both substances to be suitable solvents for reducing rubber products, it would be obvious to one of ordinary skill in the art to utilize a combination of both

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solvents with the expectation of achieving equivalent results, absent a clear showing of unexpected results attributable to the combined use of prior art solvents.

### ***Information Disclosure Statement***

All references cited on form 1449 have been considered.

### ***Conclusion***

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kriellion A. Sanders whose telephone number is 571-272-1122. The examiner can normally be reached on Monday through Thursday 6:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kriellion A. Sanders  
Primary Examiner  
Art Unit 1714